COVID-19 may have small but lasting effects on cognition and memory

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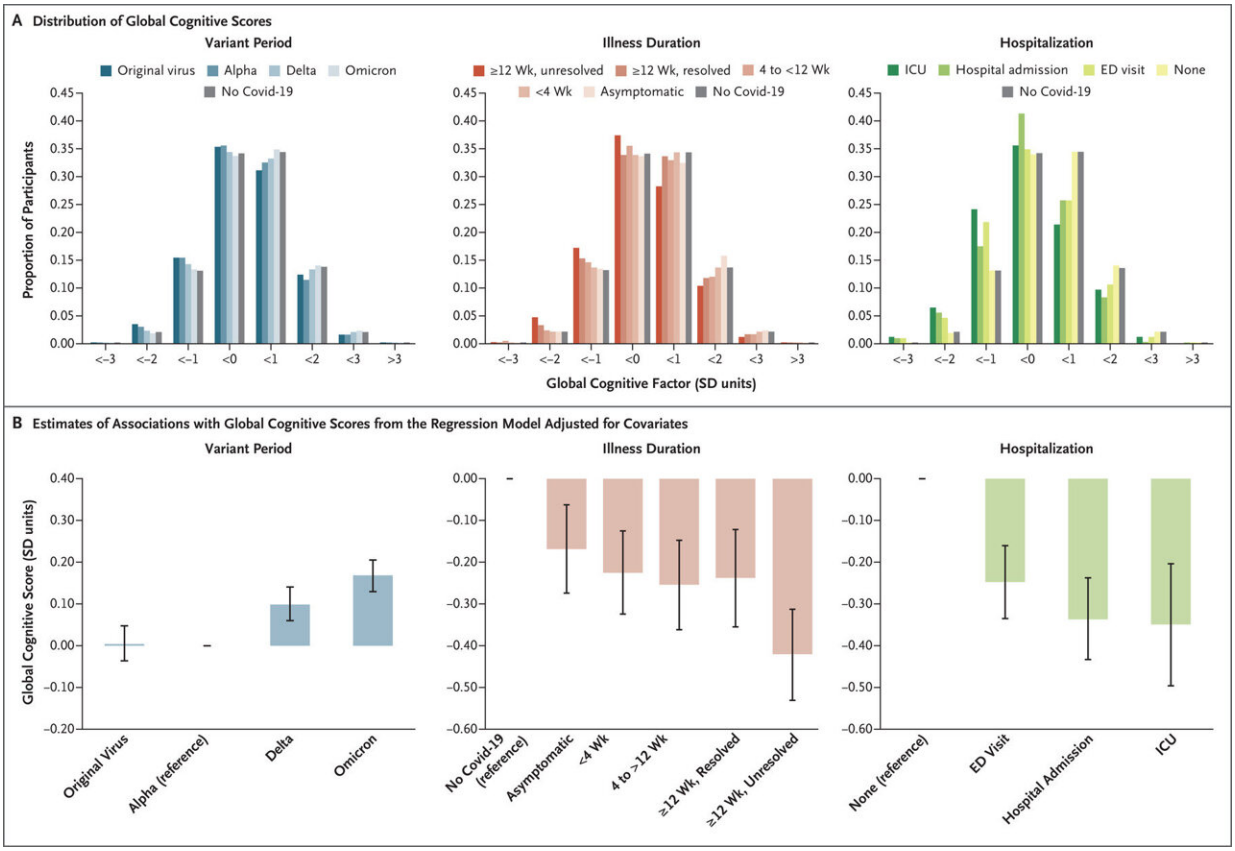

Association of Global Cognitive Scores with SARS-CoV-2 Variant Period, Illness Duration, and Hospitalization. Credit: *New England Journal of Medicine* (2024). DOI: 10.1056/NEJMoa2311330

COVID-19 may have an impact on people's cognitive and memory

abilities that lasts a year or more after infection, according to a new study by Imperial College London researchers.

The study, published today (Feb. 29) in the *New England Journal of Medicine*, reveals small deficits in the performance of cognitive and memory tasks in people who had recovered from COVID-19 compared with those who had not had COVID-19. This includes people who had long duration symptoms (i.e., Long COVID) that had eventually resolved.

The results also show that the cognitive deficits were larger for people who were hospitalized, who had ongoing long duration symptoms, or who were infected with earlier variants of the virus.

The Imperial-led study, called REACT Long COVID, enrolled more than 140,000 participants, who undertook at least one cognitive task, with many having experienced COVID-19 at various levels of severity and persistence.

Participants in the study were asked to perform an innovative online cognitive assessment on the Cognitron platform, which comprises tasks that can detect subtle changes in different aspects of their brain function, such as memory, reasoning, executive function, attention and impulsivity.

The large scale of the study and the sensitivity of the computerized tests allowed factors that explained cognitive deficits post-COVID to be examined in very fine detail while controlling for population variables such as age, demographics and pre-existing medical conditions.

The study revealed small deficits that were still detectable a year or more after infection, even in people who had short duration illness. They were larger for people who had symptoms lasting 12 weeks or more

(consistent with Long COVID), those who had been to hospital for their illness or those who were infected with one of the early variants of the SARS-CoV-2 virus.

However, people who had longer lasting symptoms that had resolved by the time they did the cognitive assessment showed small deficits that were similar in size to those of people who had a shorter duration illness.

The results showed that COVID-19 was associated with deficits in multiple areas of cognition, most notably in memory, such as the ability to remember pictures of objects that were viewed a few minutes earlier. The researchers believe this may be due to problems forming new memories rather than accelerated forgetting.

People also showed small deficits in some tasks testing executive and reasoning abilities, such as those that require spatial planning or verbal reasoning.

First author of the study Professor Adam Hampshire, from the Department of Brain Sciences at Imperial College London, said, "The potential long-term effects of COVID-19 on cognitive function have been a concern for the public, health care professionals, and policymakers, but until now it has been difficult to objectively measure them in a large population sample.

"By using our online platform to measure multiple aspects of cognition and memory at large scale, we were able to detect small but measurable deficits in cognitive task performance. We also found that people were likely affected in different ways depending on factors such as illness duration, virus variant and hospitalization."

Professor Paul Elliott, senior author and Director of the REACT program, from the School of Public Health at Imperial College London,

said, "It is reassuring that people with persistent symptoms after COVID-19, that had resolved, may expect to experience some improvement in their cognitive functions to similar levels as those who experienced short illness.

"Furthermore, the cognitive impact of COVID-19 appears to have reduced since the early stages of the pandemic, with fewer people having persistent illness, and cognition being less affected among those that were infected during the time when omicron was the dominant strain. However, given the large numbers of people who were infected, it will be important to continue to monitor the long-term clinical and cognitive consequences of the COVID-19 pandemic."

More information: Adam Hampshire et al, Cognition and Memory after Covid-19 in a Large Community Sample, *New England Journal of Medicine* (2024). DOI: 10.1056/NEJMoa2311330

Provided by Imperial College London